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TESTA, HURWITZ & THIBEAULT, LLP
HIGH STREET TOWER
125 HIGH STREET
BOSTON, MA 02110

EXAMINER	
RYMAN, DANIEL J	

ART UNIT	PAPER NUMBER
2665	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/576,676	HARCHOL-BALTER ET AL.	
	Examiner	Art Unit	
	Daniel J. Ryman	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-17, and 19-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-17, and 19-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/5/2004 have been fully considered but they are not persuasive. On page 10 of the Response, Applicant asserts that the newly added limitation, "wherein the method [or system] facilitates discovery of all cooperating nodes in the network of nodes within a number of repetitions that is proportional to the square of the logarithm of the number of cooperating nodes," is patentable over the cited prior art. Specifically, Applicant contends that Examiner indicated in the Interview Summary from the interview conducted 8 September 2004 that adding the limitation "within O log N number of repetitions" to the independent claims would overcome the cited prior art (here, O log N should have been O log^2 N to agree with the specification: See pg. 8, line 22-pg. 9, line 3). While Examiner maintains that adding the limitation "within O log^2 N number of repetitions," if properly claimed, would overcome the cited prior art, since this would require discovery to complete within a certain number of repetitions, Examiner, nonetheless, maintains that the cited prior art reads on the amended claims.

2. Applicant's amendment includes the term "facilitates." *Webster's Collegiate Dictionary* defines "facilitates" as "to make easier." Thus, Applicant's newly added limitation does not *require* the discovery of all cooperating nodes within O log^2 N repetitions. Instead, Applicant's method and system, as currently claimed, simply makes it easier to have complete discovery occur within O log^2 N repetitions. As broadly defined, the cited prior art reads on this broad limitation since the cited prior art enables a system to discover all cooperating nodes within a number of repetitions, thus making it easier to discover all cooperating nodes within O log N

repetitions. In order to require discovery of the nodes within O log^2 N repetitions, Applicant could amend the claims to read "wherein the method performs discovery ..." rather than "wherein the method facilitates discovery ...."

3. Additionally, the term "proportional" is vague and indefinite with respect to degree of proportionality. *Webster's Collegiate Dictionary* defines "proportional" as "corresponding in size, degree, or intensity." Thus, the newly added limitation simply requires that the number of repetitions correspond in size to log^2 N. However, this correspondence is not defined, i.e. the upper limit of the constant O in O log^2 N is not defined. As such, as currently worded, the newly added limitation contains the same problems as the "limited number of repetitions" amendment that Applicant previously proposed during the interview on 8 September 2004; namely, the constant O could be chosen to allow for any number of repetitions. Therefore, to overcome the cited prior art, the degree of "proportionality" should be specified.

4. Further, if Applicant amends the claims to require the discovery of all nodes within O log N repetitions, Examiner will reject the claims under U.S.C. § 112, first paragraph. Applicant discloses in the specification that it is unknown how many repetitions a pseudorandom selection would require. See pg. 8, line 22-pg. 9, line 3. The claims, if amended to require discovery, would require that the pseudorandom discovery occur within O log N repetitions. Thus, in order to overcome both the prior art rejection and a U.S.C. § 112, first paragraph, rejection, Applicant should amend the claims to (1) require that complete discovery of nodes occurs within O log N repetitions; (2) limit the degree of proportionality between the number of repetitions and log^2 N; and (3) limit the selection in step (a) to only random selecting.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 5-17, and 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brady (USPN 6,041,049) in view of Flammer (USPN 5,007,052).

7. Regarding claims 1 and 14, Brady teaches a method and system for discovery of cooperating nodes in a network of nodes in which each cooperating node has information about at least one other cooperating node (col. 2, lines 48-67), the method comprising the steps of and the system comprising means for: (a) selecting, by a first node, from cooperating node information available to the first node, a second node (col. 2, lines 48-67); (b) transmitting from the first node to the second node at least a portion of the cooperating node information available to the first node (col. 2, lines 48-67); (c) periodically repeating steps (a) and (b) (col. 2, lines 48-67) wherein the method facilitates discovery of all cooperating nodes in the network of nodes within a number of repetitions that is proportional to the square of the logarithm of the number of cooperating nodes (col. 2, lines 48-67).

Brady does not expressly disclose that the selecting is done either randomly or pseudorandomly. Flammer teaches, in a system for broadcasting information (transmitting to all neighbor nodes), that it is well known in the art to decrease overload in a network during a broadcast by "selectively but randomly address[ing] a small group of nodes in a reception region" (col. 1, lines 53-57). The combination of Brady and Flammer suggests randomly

selecting a single neighbor node or a set of neighbor nodes from the entire list of neighbor nodes in order to reduce the overhead in the system at the cost of increasing the amount of time (increasing the number of repeated steps) it takes to determine the topology of the network. It would have been obvious to one of ordinary skill in the art at the time of the invention to randomly choose by a first node, from cooperating node information available to the first node, a second cooperating node in order to decrease the bandwidth used by the system to determine the topology of the system.

8. Regarding claim 2, referring to claim 1, Brady in view of Flammer discloses that step (a) comprises randomly choosing by a first node, from cooperating node information available to the first node, a second node (Flammer: col. 1, lines 53-57).

9. Regarding claim 3, referring to claim 1, Brady in view of Flammer discloses that step (a) comprises randomly choosing by a first node, from cooperating node information available to the first node, a second node (Flammer: col. 1, lines 53-57). Brady in view of Flammer does not expressly disclose that step (a) comprises pseudo-randomly choosing by a first node, from cooperating node information available to the first node, a second node; however, Examiner takes official notice that pseudo-random selection is another well-known selection technique that substitutes for random selection. It would have been obvious to one of ordinary skill in the art at the time of the invention to pseudo-randomly choose by a first node, from cooperating node information available to the first node, a second cooperating node in order to decrease the bandwidth used by the system to determine the topology of the system using a selection technique well-known in the art.

10. Regarding claim 5, referring to claim 1, Brady in view of Flammer that step (a) comprises randomly or pseudorandoly choosing by a first node, from cooperating node information stored in the first node, one second node (Brady: col. 2, lines 48-67 and Flammer: col. 1, lines 53-57) where it is implicit that one node is chosen.

11. Regarding claim 6, referring to claim 1, Brady in view of Flammer discloses that step (b) further comprises transmitting from the first node to the second node at least a portion of the cooperating node information available to the first node (Brady: col. 2, lines 48-67), said cooperating node information comprising a list of cooperating nodes and resources available (routes) at each cooperating node (Brady: col. 2, lines 48-67).

12. Regarding claim 7, referring to claim 1, Brady in view of Flammer discloses that step (b) comprises transmitting from the first node to the second node at least a portion of the cooperating node information available to the first node, said at least a portion of the cooperating node information comprising all of the first node's cooperating node information (Brady: col. 2, lines 48-67 and col. 4, lines 18-21).

13. Regarding claim 8, referring to claim 1, Brady in view of Flammer discloses that step (c) comprises periodically repeating steps (a) and (b) by each of the cooperating nodes (Brady: col. 2, lines 48-67 and col. 3, lines 45-55).

14. Regarding claim 9, referring to claim 1, Brady in view of Flammer discloses that step (a) comprises selecting, by a first node, from cooperating node information available to the first node, a second cooperating node and a third cooperating node (Brady: col. 2, lines 48-67); and step (b) comprises transmitting from the first node to the second node and the third node the cooperating information available to the first node (Brady: col. 2, lines 48-67).

15. Regarding claim 10, referring to claim 1, Brady in view of Flammer discloses that step (a) comprises randomly or pseudorandomly selecting, by a first node, from cooperating node information available to the first node, a small number of cooperating nodes (Brady: col. 2, lines 48-67); and step (b) comprises transmitting from the first node to the small number of cooperating nodes the cooperating information available to the first node (Brady: col. 2, lines 48-67).

Brady in view of Flammer does not expressly disclose that the small number of nodes is three nodes. It is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Since Brady in view of Flammer discloses selecting a small number of nodes, it would have been obvious to one of ordinary skill in the art to select any number of nodes, including three, absent a showing of criticality by Applicant.

16. Regarding claim 11, referring to claim 1, Brady in view of Flammer discloses after step (b) and prior to step (c), the step of: (b1) merging, by the second node, the cooperating node information transmitted by the first node with cooperating node information available to the second node (Brady: col. 4, lines 18-41); and wherein step (c) comprises periodically repeating steps (a), (b), and (bl) (Brady: col. 2, lines 48-67 and col. 4, lines 18-41).

17. Regarding claim 12, referring to claim 1, Brady in view of Flammer discloses prior to step (c), the steps of: (b1) requesting, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67); (b2) receiving, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67); and wherein step (c) comprises periodically repeating steps (a), (b), (bl), and (b2) (Brady: col. 2, lines 48-67). Brady in view of Flammer does not expressly disclose that the steps (b1) and (b2) occurs after step (b) and prior to step (c); however, it would have been obvious to one of ordinary skill in the art at the time of the invention that step (b) and steps (b1) and (b2) are interchangeable since a reversal of the order of the steps will not result in a different outcome for the topology. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform steps (b1) and (b2) after step (b) and before step (c).

18. Regarding claim 13, referring to claim 1, Brady in view of Flammer discloses prior to step (c), the steps of (b1) merging, by the second node, the cooperating node information transmitted by the first node with cooperating node information available to the second node after step (b) (Brady: col. 4, lines 18-41); (b2) requesting, by the first node, from the selected cooperating node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67); (b3) receiving, by the first node, from the selected cooperating node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67); (b4) merging, by the first node, the cooperating node information transmitted by the second node with cooperating node information available to the first node (Brady: col. 2,

lines 48-67); and wherein step (c) comprises periodically repeating steps (a), (b), (b l), (b2), (b3), and (b4) (Brady: col. 2, lines 48-67).

Brady in view of Flammer does not expressly disclose that the steps (b2)-(b4) occurs after step (b) and prior to step (c); however, it would have been obvious to one of ordinary skill in the art at the time of the invention that step (b) and steps (b2)-(b4) are interchangeable since a reversal of the order of the steps will not result in a different outcome for the topology. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform steps (b2)-(b4) after step (b) and before step (c).

19. Regarding claim 15, Brady discloses a method for discovery of cooperating nodes in a network of nodes in which each cooperating node has information about at least one other cooperating node, comprising the steps of: (a) selecting, by a first node, from cooperating node information available to the first node, a second cooperating node (col. 2, lines 48-67); (b) requesting, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (col. 2, lines 48-67); (c) receiving, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (col. 2, lines 48-67); (d) periodically repeating steps (a), (b), and (c) (col. 2, lines 48-67) wherein the method facilitates discovery of all cooperating nodes in the network of nodes within a number of repetitions that is proportional to the square of the logarithm of the number of cooperating nodes (col. 2, lines 48-67).

Brady does not expressly disclose that the selecting is done either randomly or pesudorandomly. Flammer teaches, in a system for broadcasting information (transmitting to all neighbor nodes), that it is well known in the art to decrease overload in a network during a

broadcast by "selectively but randomly address[ing] a small group of nodes in a reception region" (col. 1, lines 53-57). The combination of Brady and Flammer suggests randomly selecting a single neighbor node or a set of neighbor nodes from the entire list of neighbor nodes in order to reduce the overhead in the system at the cost of increasing the amount of time (increasing the number of repeated steps) it takes to determine the topology of the network. It would have been obvious to one of ordinary skill in the art at the time of the invention to randomly choose by a first node, from cooperating node information available to the first node, a second cooperating node in order to decrease the bandwidth used by the system to determine the topology of the system.

20. Regarding claim 16, referring to claim 15, Brady in view of Flammer discloses that step (a) comprises randomly choosing by a first node, from cooperating node information available to the first node, a second cooperating node (Flammer: col. 1, lines 53-57).

21. Regarding claim 17, referring to claim 15, Brady in view of Flammer discloses that step (a) comprises randomly choosing by a first node, from cooperating node information available to the first node, a second node (Flammer: col. 1, lines 53-57). Brady in view of Flammer does not expressly disclose that step (a) comprises pseudo-randomly choosing by a first node, from cooperating node information available to the first node, a second node; however, Examiner takes official notice that pseudo-random selection is another well-known selection technique that substitutes for random selection. It would have been obvious to one of ordinary skill in the art at the time of the invention to pseudo-randomly choose by a first node, from cooperating node information available to the first node, a second cooperating node in order to decrease the

bandwidth used by the system to determine the topology of the system using a selection technique well-known in the art.

22. Regarding claim 19, referring to claim 15, Brady in view of Flammer discloses that step (a) comprises choosing by a first node, from cooperating node information stored in the first node, one cooperating node (Brady: col. 2, lines 48-67) where it is implicit that one cooperating node is chosen.

23. Regarding claim 20, referring to claim 15, Brady in view of Flammer discloses that step (b) further comprises requesting, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67), said cooperating node information comprising a list of cooperating nodes and resources (routes) available at each cooperating node (Brady: col. 2, lines 48-67).

24. Regarding claim 21, referring to claim 15, Brady in view of Flammer discloses that step (b) comprises requesting, by the first node, from the second node, at least a portion of the cooperating node information available to the second node (Brady: col. 2, lines 48-67), said at least a portion of the cooperating node information comprising all of the second node's cooperating node information (Brady: col. 2, lines 48-67 and col. 4, lines 18-21).

25. Regarding claim 22, referring to claim 15, Brady in view of Flammer discloses that step (d) comprises periodically repeating steps (a), (b), and (c) by each of the cooperating nodes (Brady: col. 2, lines 48-67 and col. 3, lines 45-55).

26. Regarding claim 23, referring to claim 15, Brady in view of Flammer discloses that step (a) comprises randomly or pseudorandomly selecting, by a first node, from cooperating node information available to the first node, a second cooperating node and a third cooperating node

(Brady: col. 2, lines 48-67); step (b) comprises requesting, by the first node, from each of the two selected cooperating nodes, at least a portion of the cooperating node information available to each of the respective second node and third node (Brady: col. 2, lines 48-67); step (c) comprises receiving, by the first node, from each of the second node and the third node, at least a portion of the cooperating node information available to each of the second node and the third node (Brady: col. 2, lines 48-67).

27. Regarding claim 24, referring to claim 15, Brady in view of Flammer discloses that step (a) comprises randomly or pseudorandomly selecting, by a first node, from cooperating node information available to the first node, a small number of cooperating nodes (Brady: col. 2, lines 48-67); step (b) comprises requesting, by the first node, from each of the small number of selected cooperating nodes, at least a portion of the cooperating node information available to each of the respective selected cooperating nodes (Brady: col. 2, lines 48-67); step (c) comprises receiving, by the first node, from each of the small number of selected cooperating nodes, at least a portion of the cooperating node information available to each of the respective selected cooperating nodes (Brady: col. 2, lines 48-67).

Brady in view of Flammer does not expressly disclose that the small number of nodes is three nodes. It is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36

(CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Since Brady in view of Flammer discloses selecting a small number of nodes, it would have been obvious to one of ordinary skill in the art to select any number of nodes, including three, absent a showing of criticality by Applicant.

28. Regarding claim 25, referring to claim 15, Brady in view of Flammer discloses after step (c) and prior to step (d), the step of: (c l) merging, by the first node, the received cooperating node information with cooperating node information available to the first node (Brady: col. 4, lines 18-41) and wherein step (c) comprises periodically repeating steps (a), (b), (c l) and (c) (Brady: col. 2, lines 48-67 and col. 4, lines 18-41).

29. Regarding claim 26, referring to claim 15, Brady in view of Flammer discloses before step (d) the step of: (aa) transmitting from the first node to the second node, at least a portion of the cooperating node information available to the first node (Brady: col. 2, lines 48-67); and wherein step (d) comprises periodically repeating steps (aa), (a), (b), and (c) (Brady: col. 2, lines 48-67).

30. Regarding claim 27 referring to claim 26, Brady in view of Flammer discloses after step (aa), the step of (bb) merging, by the second node, the cooperating node information transmitted by the first node with cooperating node information available to the second node (Brady: col. 4, lines 18-41) and wherein step (d) comprises periodically repeating steps (aa), (bb), (a), (b), and (c) (Brady: col. 2, lines 48-67 and col. 4, lines 18-41).

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Serkowski (USPN 5,914,939) see col. 1, lines 11-25 and col. 3, line 8-col. 4, line 9

which pertains to overloading a network by broadcasting topology updates, merging routing tables, and allowing changes to quickly propagate through the network. Conlon (USPN 5,051,987) see entire document which pertains to discovering the topology of a network.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 7:00-4:30 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel J. Ryman
Examiner
Art Unit 2665

DJR

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600